CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

CE143 : COMPUTER CONCEPTS & PROGRAMMING

Chapter – 4

Managing Input and Output Operation

DEPSTAR

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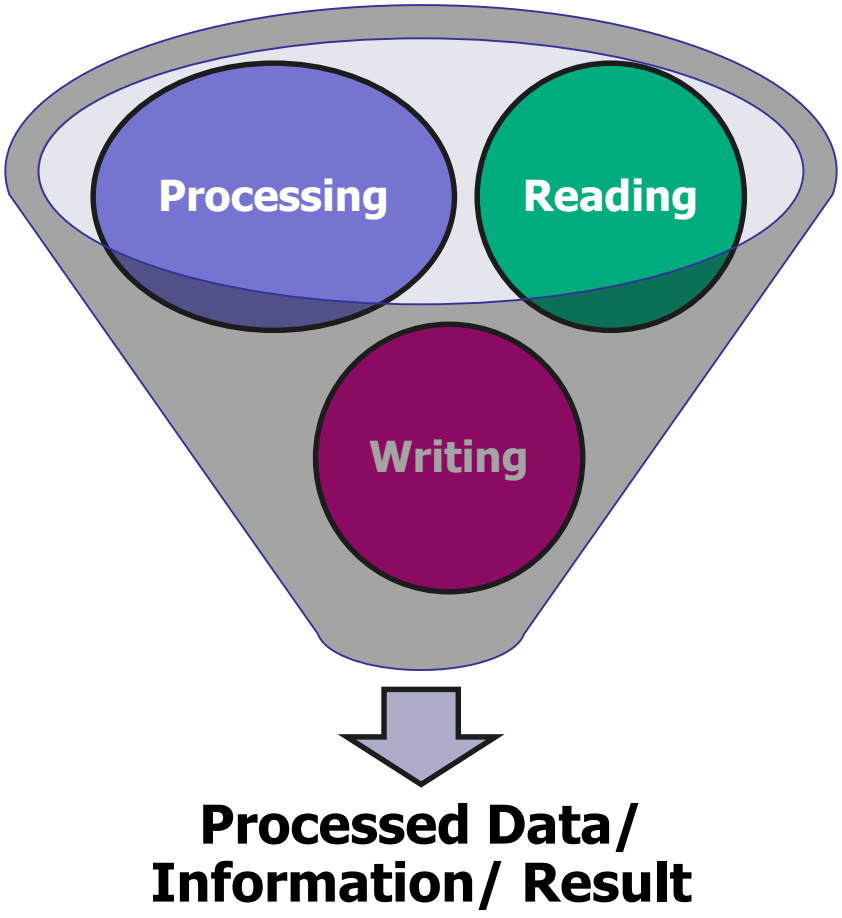
Objectives

- To be able to describe how a character is read
- To be able to express how a character is written
- To be able to explain formatted input
- To be able discuss formatted output

Introduction

- In this chapter, we will discuss
  - Reading a character, Writing a character, Introduction to ASCII code, library functions
  - Formatted input using scanf ( )
  - Formatted output of integer and real data using printf ( )

Introduction



Input:

1. X=5,a=0;
2. scanf();

Output:

1. printf()

Reading a Character

- **getchar():** Reads single character

variable_name=getchar();

Example: **char name;**

name=getchar();

Writing a Character

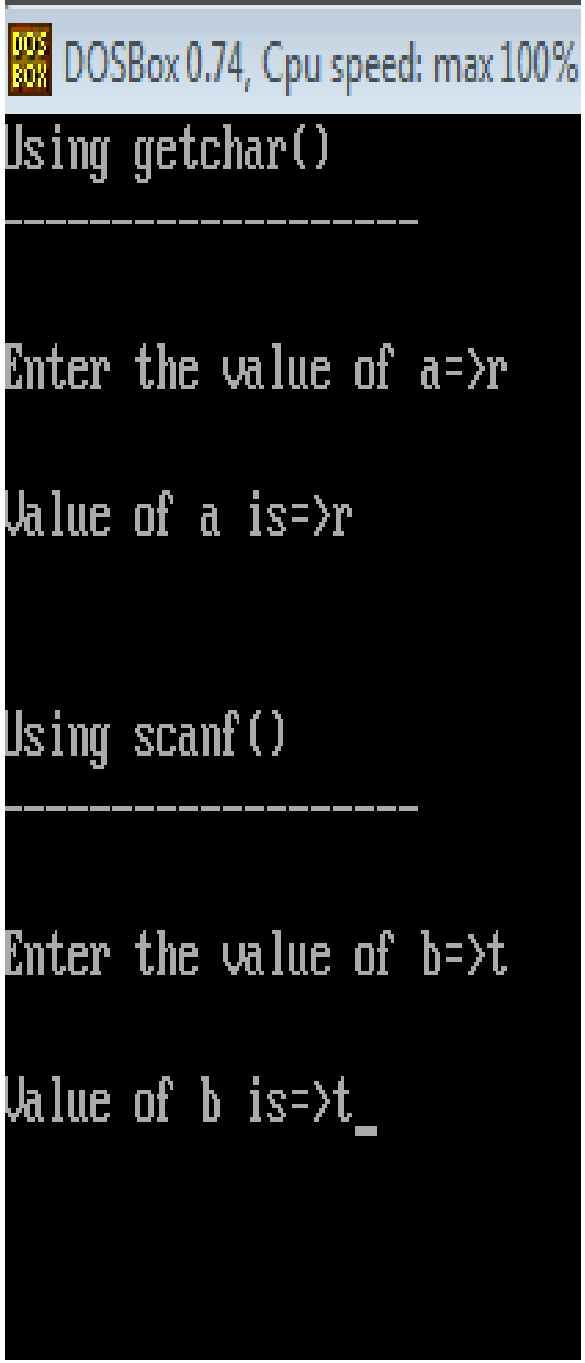
- **putchar():** Writing a character one at a time

putchar(variable_name);

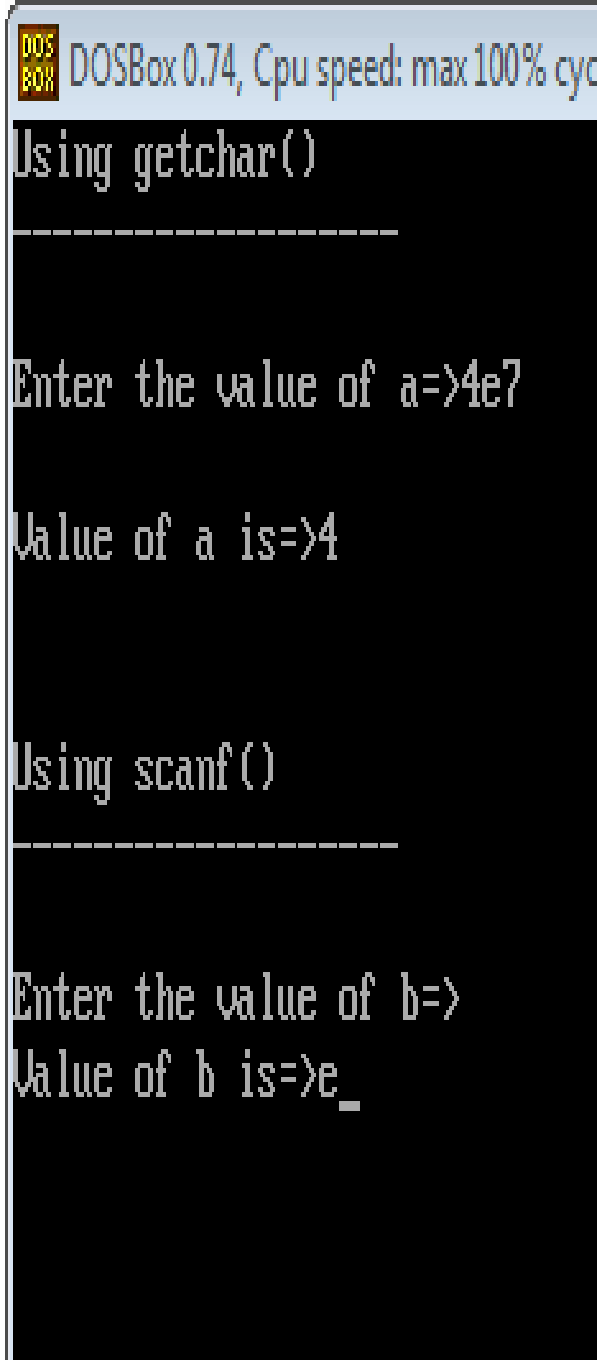
Example:
```
char var='a';
putchar(var);
putchar('\n'); \\new line
```

Using char data type

```
void main()
        {
        char a,b;
        clrscr();

        printf("Using getchar()\n");
        printf("------------------\n\n");
        printf("Enter the value of a=>");
        a=getchar();
        printf("\n");
        printf("Value of a is=>");
        putchar(a);

        printf("\n\n\n");

        printf("Using scanf()\n");
        printf("------------------\n\n");
        printf("Enter the value of b=>");
        scanf("%c",&b);
        printf("\n");
        printf("Value of b is=>%c",b);
        getch();
        }
```

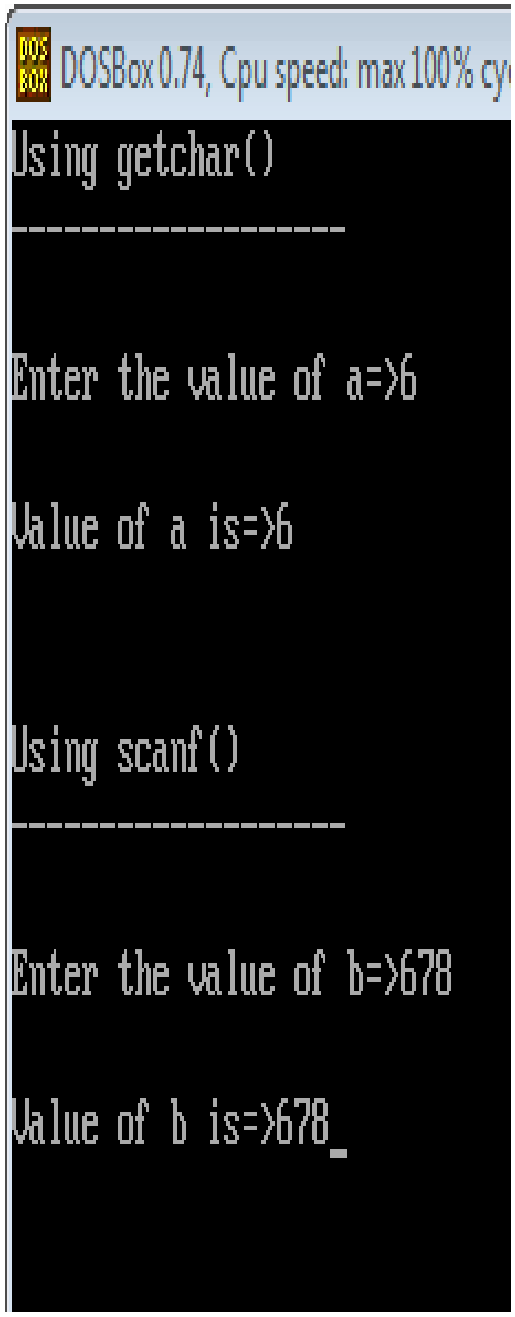

DOSBox 0.74, Cpu speed: max 100%
Using getchar()
Enter the value of a=>r
Value of a is=>r
Using scanf()
Enter the value of b=>t
Value of b is=>t

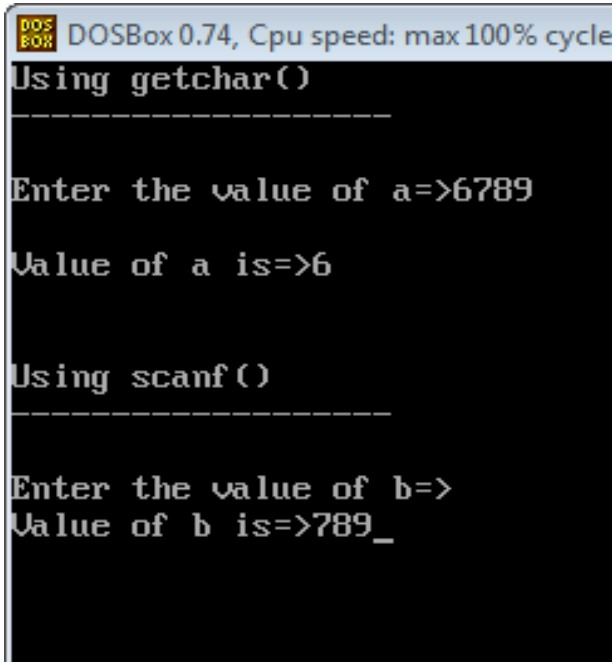

DOSBox 0.74, Cpu speed: max 100% cyc
Using getchar()
Enter the value of a=>tr
Value of a is=>t
Using scanf()
Enter the value of b=>
Value of b is=>r

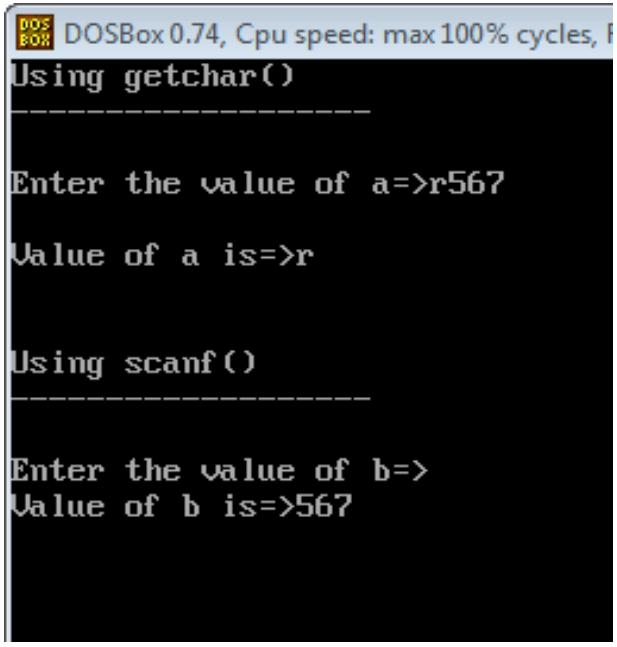

DOSBox 0.74, Cpu speed: max 100% cyc
Using getchar()
Enter the value of a=>4e7
Value of a is=>4
Using scanf()
Enter the value of b=>
Value of b is=>e

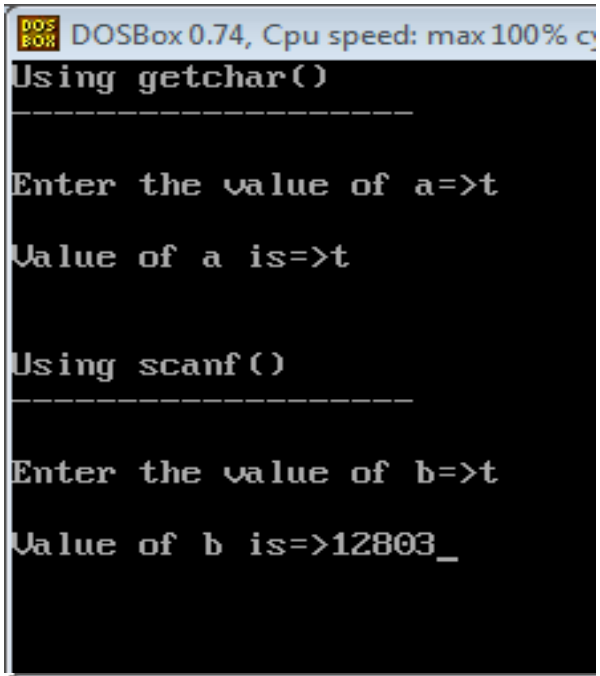
Using int data type

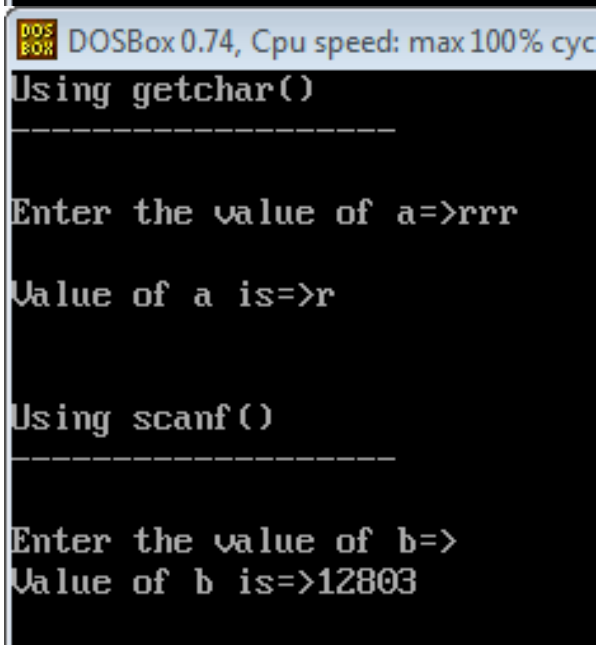
```
void main()
        {
        int a,b;
        clrscr();

        printf("Using getchar()\n");
        printf("------------------\n\n");
        printf("Enter the value of a=>");
        a=getchar();
        printf("\n");
        printf("Value of a is=>");
        putchar(a);

        printf("\n\n\n");

        printf("Using scanf()\n");
        printf("------------------\n\n");
        printf("Enter the value of b=>");
        scanf("%d",&b);
        printf("\n");
        printf("Value of b is=>%d",b);
        getch();
        }
```


DOSBox 0.74, Cpu speed: max 100% cy
Using getchar()
Enter the value of a=>6
Value of a is=>6
Using scanf()
Enter the value of b=>678
Value of b is=>678


DOSBox 0.74, Cpu speed: max 100% cycle
Using getchar()
Enter the value of a=>6789
Value of a is=>6
Using scanf()
Enter the value of b=>
Value of b is=>789


DOSBox 0.74, Cpu speed: max 100% cycles,
Using getchar()
Enter the value of a=>r567
Value of a is=>r
Using scanf()
Enter the value of b=>
Value of b is=>567


DOSBox 0.74, Cpu speed: max 100% cy
Using getchar()
Enter the value of a=>t
Value of a is=>t
Using scanf()
Enter the value of b=>t
Value of b is=>12803


DOSBox 0.74, Cpu speed: max 100% cyc
Using getchar()
Enter the value of a=>rrr
Value of a is=>r
Using scanf()
Enter the value of b=>
Value of b is=>12803

ctype.h Library Function

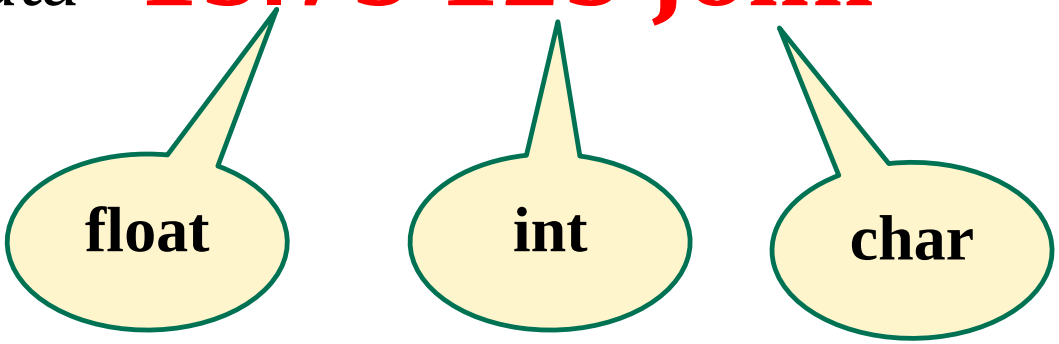
- Declares several functions that are useful for testing and mapping characters.

Character macros	
Macro	**Nonzero (true) is returned if**
isalpha(c)	c is a letter
isupper(c)	c is an uppercase letter
islower(c)	c is a lowercase letter
isdigit(c)	c is a digit
isalnum(c)	c is a letter or digit
isxdigit(c)	c is a hexadecimal digit
isspace(c)	c is a white space character
ispunct(c)	c is a punctuation character
isprint(c)	c is a printable character
isgraph(c)	c is a printable, but not a space
iscntrl(c)	c is a control character
isascii(c)	c is an ASCII code

Formatted Input

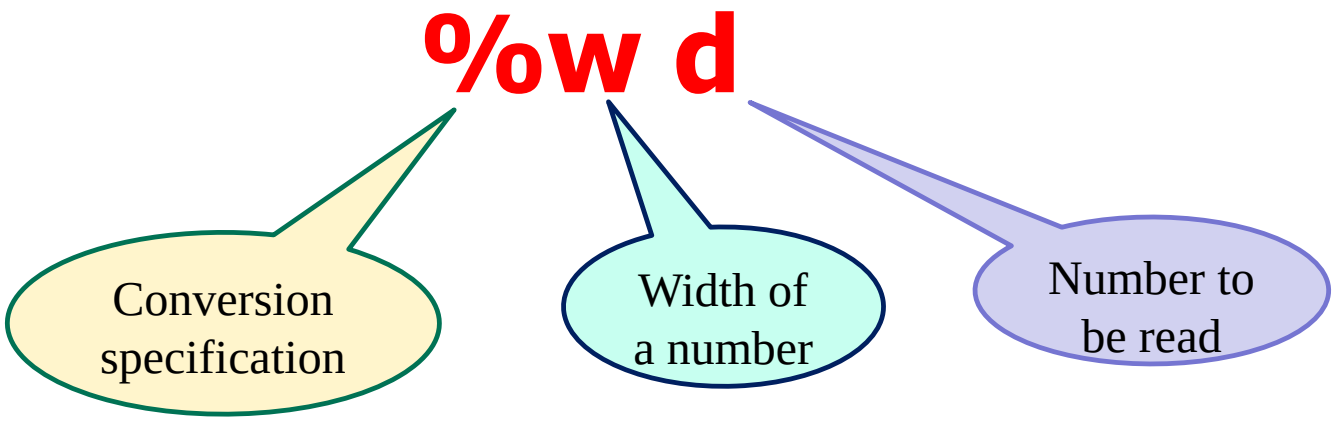
- It refers to an input data that has been arranged in a particular format

Example: Input data= **15.75 123 John**



scanf("field format",arg 1, arg 2,…arg n);

Formatted Input: Inputting Integer Numbers



scanf ("%2d %5d",&num1,&num2);

Case 1: For input 50 and 31426
num1=50 and num2=31426

Case 2: For input 31426 and 50
num1=31 and num2=426 **(50 is unread will be assigned to first variable in next scanf call.)**

Formatted Input: Inputting Integer Numbers

scanf ("%d %*d %d",&a, &b);

- Assigning a data 123, 456 and 78.2 respectively.
- Assigned data would be :

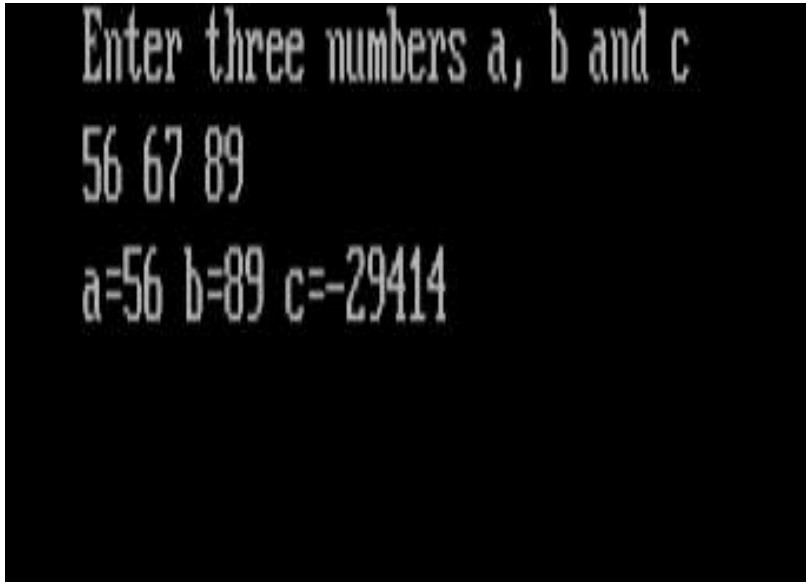
  a=123

  456 skipped (because of *)

  B=78

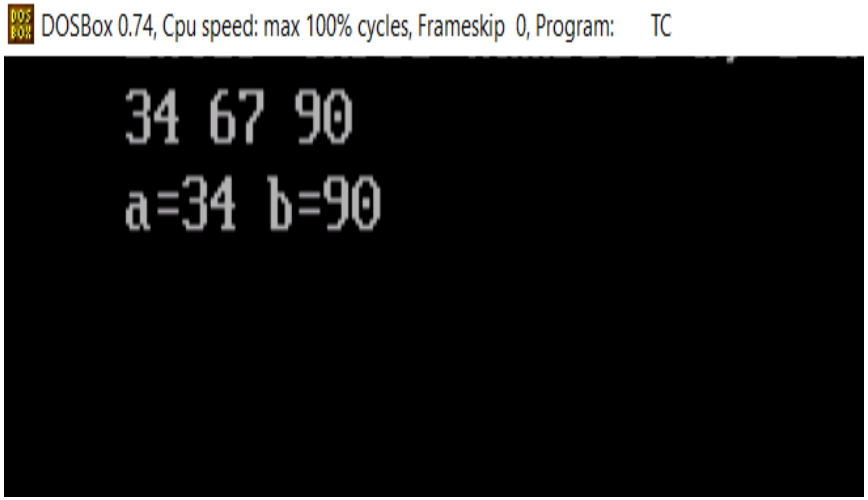
Formatted Input: Inputting Integer Numbers

```
void main()
        {
        int a,b,c;
        clrscr();
        printf("Enter three numbers a, b and c\n");
        scanf("%d %*d %d",&a,&b,&c);
        printf("a=%d b=%d c=%d",a,b,c);
        getch();
        }
```



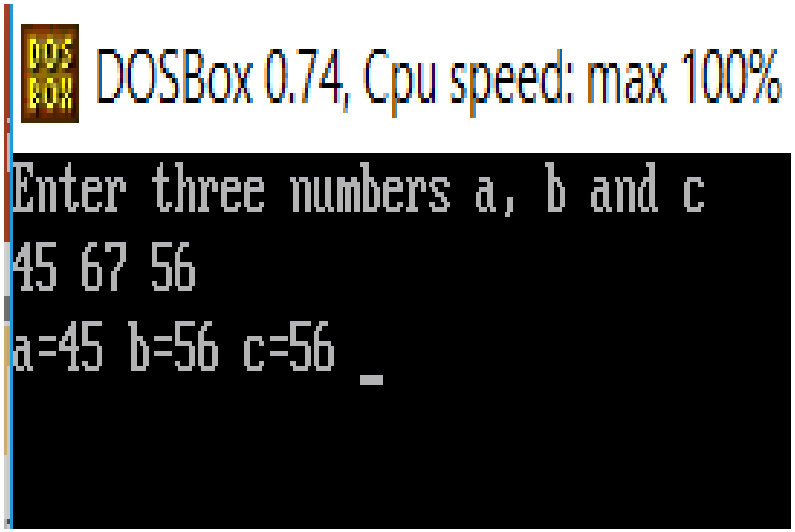
Formatted Input: Inputting Integer Numbers

```
void main()
        {
        int a,b,c;
        clrscr();
        printf("Enter three numbers a, b and c\n");
        scanf("%d %*d %d",&a,&b);
        printf("a=%d b=%d ",a,b);
        getch();
        }
```



Formatted Input: Inputting Integer Numbers

```
void main()
        {
        int a,b,c;
        clrscr();
        printf("Enter three numbers a, b and c\n");
        scanf("%d %*d %d",&a,&b);
        printf("a=%d b=%d  c=%d",a,b);
        getch();
        }
```



```
void main()
        {
        int a,b,c,x,y,z,p,q,r;
        clrscr();
        printf("Enter three numbers a, b and c\n");
        scanf("%d %*d %d",&a,&b,&c);
        printf("a=%d b=%d %d",a,b,c);
        printf("\n-----------------------------------------\n");
        printf("Enter two 4-digits numbers x and y\n");
        scanf("%2d %4d",&x,&y);
        printf("x=%d y=%d",x,y);
        printf("\n-----------------------------------------\n");
        printf("Enter two integrers numbers a and x\n");
        scanf("%d %d",&a,&x);
        printf("a=%d x=%d ",a,x);
        printf("\n-----------------------------------------\n");
        printf("Enter a 9-digits numbers \n");
        scanf("%3d %4d %3d",&p,&q,&r);
        printf("p=%d q=%d r=%d ",p,q,r);
        printf("\n-----------------------------------------\n");
        printf("Enter two three digits numbers\n");
        scanf("%d %d",&x,&y);
        printf("x=%d y=%d",x,y);
        getch();
        }
```

Formatted Input: Inputting Integer Numbers

```
Enter three numbers a, b and c
1 2 3
a=1 b=3 -29446
-----------------------------------------------
Enter two 4-digits numbers x and y
6789 4321
x=67 y=89
-----------------------------------------------
Enter two integrers numbers a and x
44 66
a=4321 x=44
-----------------------------------------------
Enter a 9-digits numbers
123456789
p=66 q=1234 r=567
-----------------------------------------------
Enter two three digits numbers
123 456
x=89 y=123
```

Formatted Input: Inputting Real Numbers

- No field width like integers, so only %f is used
- For double %lf is used

scanf ("%f %f %f", &x, &y, &z);

Case 1: For input 475.89, 43.21E-1 and 678
x=475.89, y=4.321 and z=678

Note: A number may be skipped using %*f.

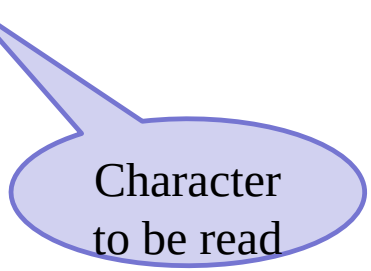
Formatted Input: Inputting Real Numbers

```
void main()
        {
        float x,y;
        double p,q;
                clrscr();
        printf("Enter value of x and y\n");
        scanf("%f %e",&x,&y);
        printf("\n x=%f y=%f",x,y);
        printf("\n-----------------------------------------\n");
        printf("Enter value of p and q\n");
        scanf("%lf %lf",&p,&q);
        printf("p=%.12lf q=%12e",p,q);


        getch();
        }
```

```
Enter value of x and y
12.3456 17.5e-2

 x=12.345600 y=0.175000
--------------------------------------------------

Enter value of p and q
4.142857142857 18.56789012345678 90
p=4.142857142857 q=1.856789e+01
```

Formatted Input: Inputting Character Strings

%ws or %w c



%s specifier can't read the blank space